



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/955,517

09/18/2001

Cyrus E. Tabery

G0228

8552

7590

05/04/2006

Himanshu S. Amin
Amin & Turocy, LLP
National City Center
1900 E. 9th Street, 24th floor
Cleveland, OH 44114

EXAMINER

KACKAR, RAM N

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/955,517

Applicant(s)

TABERY ET AL.

Examiner

Ram N. Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,9-12 and 15-26 is/are pending in the application.
- 4a) Of the above claim(s) 15-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,9-12 and 25-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-2, 4-5, 9-12, 25 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Subramanian et al (US Patent No. 6,562,248 B1).**

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Subramanian et al teach (Fig. 1) a system for creating a complimentary phase shift mask comprising:

a mask creating component (etching system) 16 operable to create features 12 in a mask 14;

a measurement component 18 operable to measure the shape, depth and/or width of the apertures 12 created in the mask 14, the measurement component 18 includes a scatterometry system for detecting the reflected and/or diffracted light; and a control system 17 operatively

Art Unit: 1763

coupled to the etching system 16 and the measurement component 18, the control system 7 is programmed and/or configured to control the etching system 16 in accordance with the measured characteristic of the features (column 7, line 10 through column 8, line 48, column 9, line 11 through column 10, line 65). It is inherent that the measuring system could be used to improve quality control by measuring critical dimensions.

Further regarding claims 1, 25 and 26: the complimentary phase shift mask and alternating aperture phase shift mask are considered same as the apparatus as disclosed is inherently capable of being used for creating either of the phase shift mask.

2. Claims 1-2, 4-5, 10-12, 25 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Jin et al (US PUB 20020028392).

Jin et al teach a system for fabricating an alternating aperture phase shift mask (Paragraph 04) comprising:

a mask fabricating component (etching or deposition system) with control of optical properties and thickness (Abstract); a measurement component for physical and optical monitoring and a control system to control the fabrication process to achieve desired results depending upon monitored parameters (Paragraph 25, 129, 131, 148 and 166).

Regarding emitting component that directs light and analysis component that measures reflected or refracted light, these components are inherent in view of the teaching that “Desired optical transmission and phase-shifting functions of the mask are achieved by controlling the optical properties and thickness of constituent film layers “ This and related teaching elsewhere

Art Unit: 1763

as indicated, discloses inherent control of fabrication process dependent upon monitoring optical properties (Paragraph 25, 129, 131, 148 and 166).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al (US PUB 20020028392) in view of Niu et al (US PUB 20020131055).**

Jin et al disclose optical monitoring but do not disclose scatterometry system for profiling the features.

Niu et al discloses scatterometry used for optical monitoring features on phase shift mask for mask corrections (Abstract). Niu et al further disclose grids (Fig 12-54 and paragraph 18) for testing purposes.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have used scatterometry for feature profiling for the (FSM) mask fabrication of Jin et al for its use in the measurement of diffracted light as taught by Niu et al.

Response to Arguments

Applicant's arguments filed 3/2/2006 have been fully considered but they are not persuasive.

Applicant argues that Subramanian does not disclose in-situ and ex-situ monitoring and control of features.

In-situ and ex-situ monitoring, however, is only an intended use and is not directed to any structure.

Applicant's argument regarding selectively etching is disclosed by Subramanian (Abstract).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 1763

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar
Primary Examiner AU 1763